

WHAT IS CLAIMED IS:

1. A selection switch and infinite switch energy regulator unit, comprising:
an infinite switch energy regulator for adapting an input voltage level to an average output voltage level, the energy regulator having a rotatable shaft for adjusting the average output voltage level; and
an input voltage selector for selecting between a plurality of input voltages by actuation of a rotatable mechanism, and having as an output the input voltage level to the energy regulator, the rotatable shaft operatively coupled to the rotatable mechanism.
2. The unit of claim 1, wherein the rotatable mechanism has an aperture, the rotatable shaft extending through the aperture in sliding engagement therewith.
3. The unit of claim 2, wherein the aperture has an interior shape that corresponds to a cross-sectional shape of the rotatable shaft such that the rotatable mechanism is rotated with the rotatable shaft.
4. The unit of claim 1, wherein the energy regulator provides a variable duty cycle in response to rotation of the rotatable shaft.
5. The unit of claim 4, wherein a maximum duty cycle corresponding to a maximum average output voltage level is provided by the energy regulator, and wherein the input voltage selector toggles to a higher input voltage level from a lower input voltage level at a shaft angle of the rotatable shaft corresponding to the maximum duty cycle of the energy regulator at the lower input voltage level.
6. The unit of claim 5, wherein the rotatable mechanism has contacts for the lower input voltage level and contacts for the higher input voltage level and a dead-time dwell angle between switching from the lower input voltage level, to the higher input voltage level such that the contacts for the higher input voltage level are prevented from closing for at least a predetermined time after the contacts for the lower input voltage level are opened.

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7. The unit of claim 6, further comprising a jumper wire electrically connecting the output of the input voltage selector to a first input of the energy regulator.

8. The unit of claim 7, wherein the first input of the energy regulator is an L2 input.

9. The unit of claim 8, further comprising a face plate bracket on the input voltage selector and a threaded plate on the face plate bracket, the threaded plate including mounting threads for mounting the unit.

10. The unit of claim 9, wherein the input voltage selector includes: first and second sides; first and second inputs on the first side; and the output on the second side.

11. The unit of claim 10, wherein the energy regulator has first and second outputs on a first side, first and second inputs on a second side, the output of the input voltage selector being on the same side as the inputs of the energy regulator.

12. The unit of claim 11, wherein the input voltage selector is an F-switch.

13. The unit of claim 12, wherein the plurality of input voltages includes 120 volt and 240 volt.

14. The unit of claim 13, wherein the dead-time dwell angle is between about 10° to about 40°.

15. The unit of claim 13, wherein the dead-time dwell angle is about 20°.

16. A voltage selector switch and infinite switch combination, comprising:
a voltage selector switch rotatably controlled to selectively provide as an output a first input voltage or a second input voltage;
an infinite switch mechanically and electrically coupled to the voltage selector switch, with an input connected to the output of the voltage selector switch, and providing a

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duty cycle that is rotatably controlled and is further dependent on the output of the voltage selector switch provided as an input to the infinite switch; and

a single rotatable shaft coupled to the voltage selector switch and the infinite switch for rotatably controlling the selector switch and the infinite switch.

17. The combination of claim 16, wherein the voltage selector switch is configured to receive 120 volt as the first input voltage and 240 volt as the second input voltage, with the duty cycle provided by the infinite switch changing in response to switching between the first and second input voltages.

18. The combination of claim 17, wherein the selector switch has a cam with a pre-defined dwell between the first and second input voltages that ensures an electrical arc produced by opening contacts in the selector switch for the first input voltage is extinguished before contacts in the selector switch for the second input voltage make.

19. The combination of claim 18, wherein the pre-defined dwell is between about 10° to about 40°.

20. The combination of claim 18, wherein the pre-defined dwell is about 20°.

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